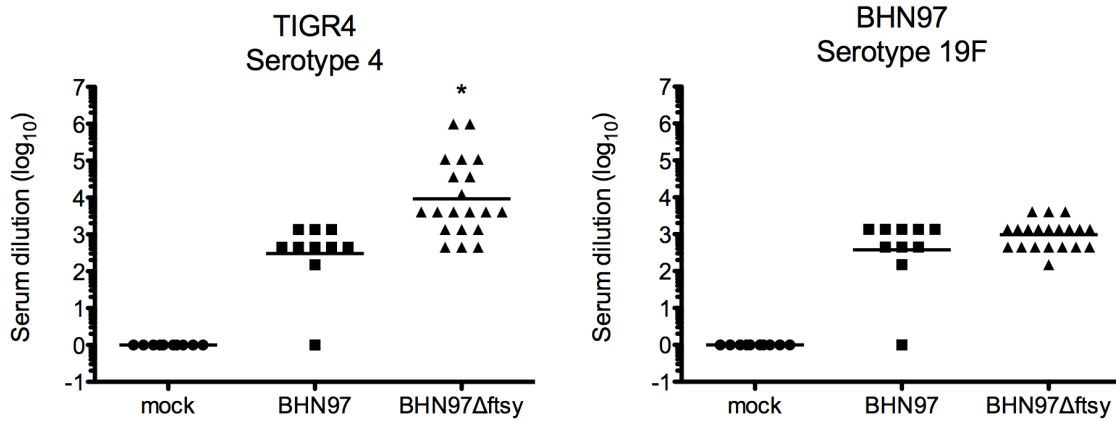


**Figure S5. Live vaccine confers greater heterologous antibody titers than prolonger colonization with parental strain.** Mice were either infected with a single dose of the BHN97 strain, resulting in colonization for over 4 weeks, or subjected to the BHN97  $\Delta$ ftsY vaccine regimen as described in the methods section. While both groups developed equivalent antibody titers against the parental 19F strain, the live vaccine resulted in significantly greater antibody titers against heterologous strains. \*=  $p < 0.05$  by Mann-Whitney.



**Table S1. Primers used in this study.**

Oligonucleotide	Sequence
FTSY UP F	CGACCATTATCTTGGTAAGGAAATGATCC
FTSY UP R	GAGTCGCTTTTGTAAATTTGGTCAGAAGCAAAAATCCTGCAAGGCATAAAC
FTSY DOWN F	GTTTGCTTCTAAGTCTTATTTCTTAGTTCTCCTTTAGCACATATTCTTC
FTSY DOWN R	GGCTTTGAATCCATTGATATTGTTCTGG
CAXP UP F	CGCATTCTTGTCAAAACCGAGTTTGCG
CAXP UP R	GAGTCGCTTTTGTAAATTTGGGCCATGACAGGTGACGGTGTCAATGACGCGCC
CAXP DOWN F	GTTTGCTTCTAAGTCTTATTTCCCGCATCTTGAAGCATACCAGCAATATGACC
CAXP DOWN R	GGAGGAGACACATGTCAAAGAACAACAAAACGCCAAGCG